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THE UNITED STATES PATENT AND TRADEMARK OFFICE

**Patent Application**

Applicant(s): Lior Shabtay  
Docket No.: 500001-A-01-US (Shabtay)  
Serial No.: 09/718,143  
Filing Date: November 21, 2000  
Group: 2153  
Examiner: Aaron N. Strange

Title: Dynamic Load Balancer

I hereby certify that this paper is being deposited on this date with the U.S. Postal Service as first class mail addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Signature: *[Signature]* Date: November 23, 2005

TRANSMITTAL OF SUPPLEMENTAL APPEAL BRIEF

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Submitted herewith are the following documents relating to the above-identified patent application:

- (1) Response to Office Action; and
- (2) Supplemental Appeal Brief.

There is no additional fee due in conjunction with the response. In the event of non-payment or improper payment of a required fee, the Commissioner is authorized to charge or to credit **Avaya Inc. Deposit Account No. 50-1602** as required to correct the error.

Respectfully submitted,

*Joseph B. Ryan*

Date: November 23, 2005

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RESPONSE TO OFFICE ACTION

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In response to the Office Action dated August 24, 2005 in the above-referenced application, Applicant hereby requests reinstatement of the appeal. A Supplemental Appeal Brief is submitted concurrently herewith.

Respectfully submitted,

Date: November 23, 2005

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SUPPLEMENTAL APPEAL BRIEF

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313

Sir:

This Supplemental Appeal Brief is submitted in response to the Office Action dated August 24, 2005 in the above-referenced application, in which the Examiner reopened prosecution in response to the Appeal Brief filed May 16, 2005.

Applicant (hereinafter referred to as "Appellant") has submitted concurrently herewith a response to the Office Action, requesting reinstatement of the appeal.

REAL PARTY IN INTEREST

The present application is assigned to Avaya Inc. or a subsidiary thereof. Avaya Inc. is the real party in interest.

RELATED APPEALS AND INTERFERENCES

There are no known related appeals and interferences.

### STATUS OF CLAIMS

Claims 1-41 are currently pending in the application. Claims 1, 13, 28 and 37 are the independent claims. Claims 1-7, 11-24 and 28-41 stand rejected variously under §§112 and 103(a). The Examiner indicates that claims 8-10 and 25-27 would be allowable if rewritten in independent form. The rejections of claims 1-7, 11-24 and 28-41 are appealed.

### STATUS OF AMENDMENTS

Amendments to claims 3, 6 and 9 were filed after final rejection pursuant to 37 C.F.R. §1.116(b)(1). More specifically, claims 3 and 9 were amended to address typographical errors while claim 6 was amended to correct a rejection under 35 U.S.C. §112. In addition, independent claims 1, 13, 28 and 37 were amended after final rejection pursuant to 37 C.F.R. §1.116(b)(2) to place the claims in better condition for consideration on appeal.

In the Advisory Action dated April 7, 2005, the amendments of claims 3, 6 and 9 are not addressed even though, in each case, Appellant's amendments complied with the Examiner's recommendations (see Final Office Action dated February 16, 2005, pp. 2 and 5). The Examiner expressly rejects the amendments of independent claims 1, 13, 28 and 37 because "they fail to place the application in condition for allowance and raise new issues that would require further consideration and/or search" (Advisory Action dated April 7, 2005, p. 2).

With respect to the amendments of independent claims 1, 13, 28 and 37, Appellant amended these claims in order to remove issues of contention that arose during the examination and to reduce the issues for consideration on appeal. More specifically, Appellant attempted to amend each claim to include the limitation that the load balancer and accelerator switch elements are separate and discrete from one another. Nonetheless, in rejecting these amendments, the Examiner states that these limitations have not previously been considered. Appellant respectfully disagrees. The separation of the load balancer element from the accelerator switch element was argued by Appellant in responses to both the First and Second Office Actions (see, e.g., Response to First Office Action dated August 30, 2004, p. 10, 2nd paragraph). These arguments were acknowledged by the Examiner in the Final Office Action as "features upon which appellant relies" (see, e.g., Final Office

Action dated February 16, 2005, p. 3, #6). Therefore, Appellant believes that these amendments relate to issues that were considered by the Examiner in the course of the First and Second Office Actions and should have been entered under 37 C.F.R. §1.116(b)(2).

### SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 is directed to a method of accelerating the operation of a load balancer by an acceleration switch. The method comprises the step of receiving, by the accelerator switch, packets directed to the load balancer. The load balancer is configured to operate in a first mode and a second mode, wherein the load balancer operating in the first mode changes at least one of a destination IP address and a destination port of one or more packets it forwards and the load balancer operating in the second mode changes at least a source IP address and a destination IP address of one or more packets it forwards. The method also comprises the step of determining, for at least one of the received packets, whether the packets match an entry of a list of packet groups, by comparing fewer than five packet parameters that are not changed by the load balancer to respective fields of entries of the list. In addition, the method further comprises the step of forwarding, by the accelerator switch, at least one of the received packets, directly to its destination, responsive to the determining.

Independent claim 13 is directed to a method of creating an entry in a list which correlates between packet groups and respective destination servers. The method comprises the step of receiving, by an accelerator, a packet directed from or to a load balancer. The load balancer is configured to operate in a first mode and a second mode, wherein the load balancer operating in the first mode changes at least one of a destination IP address and a destination port of one or more packets it forwards and the load balancer operating in the second mode changes at least a source IP address and a destination IP address of one or more packets it forwards. The method also comprises the step of creating, by the accelerator, an entry comprising parameters not changed by the load balancer in the list of destination servers, responsive to the received packet.

Independent claim 28 is directed to a load balancing accelerator comprising an input interface which receives packets directed to a load balancer, a table which lists packet groups and their respective destination servers, the table having physical entries which can accommodate different field

sets for storage of data entries, and a comparator which compares at least one of the packets directed to the load balancer to one or more of the data entries of the table. In addition, the load balancing accelerator further comprises a forwarding unit which forwards at least one of the packets for which a match was found by the comparator, directly to a server, responsive to the contents of the matching data entry, and a controller which determines in which field set, from the plurality of different field sets, each of the data entries of the table is stored.

Independent claim 37 is directed to a load balancing accelerator comprising an input interface which receives packets directed to a load balancer, a table which lists packet groups and their respective destination servers, the table having physical entries which can accommodate different field sets for storage of data entries, and a comparator which compares at least one of the packets directed to the load balancer to one or more of the data entries of the table. In addition, the load balancing accelerator further comprises a forwarding unit which forwards at least one of the packets for which a match was found by the comparator, directly to a server, responsive to the contents of the matching data entry, and a controller which determines in which field set, from the plurality of different field sets, each of the data entries of the table is stored.

FIGS. 1 and 8 show schematic block diagrams of server farms with one and two load balancers, respectively, in accordance with different embodiments of this invention. FIGS. 2 and 4 show exemplary load balancing tables. Finally, FIGS. 3, 5 and 7 show flow charts of the steps performed by an accelerator upon receiving a packet in accordance with different embodiments of this invention.

Many advantages flow from the teachings of the present invention. The prior art generally uses a set of five parameters which identify communication sessions in differentiating between different groups based on the general practice that load balancers relate the same way to packets belonging to a single session (Specification, p. 2, lines 28-30). Many load balancers, however, relate the same way to larger groups defined by sets of parameters including fewer than five parameters. By using these smaller sets of parameters in grouping the packets, the operation of the accelerator is simplified (e.g., a load balancing table of the accelerator is kept small), without violating load balancing rules of the accelerated load balancer. In addition, in some cases it is possible to identify

communication sessions based on different sets of parameters, as some of the parameters in the set may be superfluous in a specific context. Using fewer parameters simplifies the operation of the load-balancing accelerator and reduces the amount of storage space required (Specification, p. 2, line 30 - p. 3, line 6).

#### GROUND OF REJECTION TO BE REVIEWED ON APPEAL

1. Claim 6 is rejected under 35 U.S.C. §112, 2nd paragraph.
2. Claims 1-5, 7, 11-17, 19 and 23 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,774,660 (hereinafter "Brendel") in view of U.S. Patent No. 6,098,093 (hereinafter "Bayeh") in further view of allegedly admitted prior art in further view of U.S. Patent No. 6,157,644 (hereinafter "Bernstein").
3. Claims 28-41 are rejected under 35 U.S.C. §103(a) as being unpatentable over Brendel in view of Bernstein.
4. Claims 18, 20-22 and 24 are rejected under 35 U.S.C. §103(a) as being unpatentable over Brendel in view of Bayeh in further view of allegedly admitted prior art in further view of Bernstein in further view of Cisco Systems, *Catalyst 6000 Family Accelerated Server Load Balancing*, [http://www.cisco.com/warp/public/cc/pd/si/casi/ca6000/tech/aslb\\_wp.htm](http://www.cisco.com/warp/public/cc/pd/si/casi/ca6000/tech/aslb_wp.htm) (hereinafter "Cisco").
5. Claim 6 is rejected under 35 U.S.C. §103(a) as being unpatentable over Brendel in view of P. Srisuresh et al., *RFC2391: Load Sharing using IP Network Address Translation (LSNAT)*, August 1998 (hereinafter "Srisuresh") in further view of Bernstein.

#### ARGUMENT

Appellant incorporates by reference herein the disclosures of all previous responses filed in the present application, namely, office action responses dated August 30, 2004 and March 16, 2005, and the appeal brief dated May 16, 2005.

1. Rejection under 35 U.S.C. §112, 2nd paragraph

Claim 6

In the Final Office Action dated February 16, 2005 on p. 5, the Examiner recommends that claim 6 be amended to specify that the load balancer element is operating in the first mode. Appellant agrees and, therefore, filed the corresponding amendment after final rejection pursuant to 35 C.F.R. §1.116(b). Nonetheless, the Examiner failed to enter this amendment. The §112 rejection of claim 6 therefore remains at issue on appeal.

2. Rejection under 35 U.S.C. §103(a) over Brendel in view of Bayeh in further view of allegedly admitted prior art in further view of Bernstein

Claims 1-5, 7, 11 and 12

Appellant initially notes that a *prima facie* case of obviousness can only be established if there is “some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.” Manual of Patent Examining Procedure (MPEP), Eighth Edition, August 2001, §2143. Any such showing of obviousness “must be based on objective evidence of record” rather than “subjective belief and unknown authority.” In re Sang-Su Lee, 277 F.3d 1338, 1343-44, 61 USPQ2d 1430 (Fed. Cir. 2002). What is more, “[i]f the proposed modification or combination of the prior art invention would change the principle of operation of the prior art invention being modified, then the teachings of the reference are not sufficient to render the claims *prima facie* obvious.” MPEP §2143.01, *citing In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

Based on these criteria, Appellant respectfully asserts that the current §103(a) rejection of claims 1-5, 7, 11 and 12 is defective for at least two reasons. First, there is no objective evidence of record creating a suggestion or motivation in the art for combining the proposed references. Second, the proposed combination changes the principle of operation of the prior art invention being modified.

Independent claim 1, for example, sets forth:



A method of accelerating the operation of a load balancer by an accelerator switch, comprising:

receiving, by the accelerator switch, packets directed to the load balancer, the load balancer being configured to operate in a first mode and a second mode, wherein the load balancer operating in the first mode changes at least one of a destination IP address and a destination port of one or more packets it forwards and the load balancer operating in the second mode changes at least a source IP address and a destination IP address of one or more packets it forwards;

determining, for at least one of the received packets, whether the packets match an entry of a list of packet groups, by comparing fewer than five packet parameters that are not changed by the load balancer to respective fields of entries of the list; and

forwarding, by the accelerator switch, at least one of the received packets, directly to its destination, responsive to the determining.

In formulating the §103(a) rejection of this claim, the Examiner relies on elements of Brendel, Bayeh, allegedly admitted prior art and Bernstein. In stating the motivation for combining aspects of Bayeh with Brendel, the Examiner merely states on p. 6 of the Current Office Action dated August 24, 2005:

The use of session identifiers [as taught by Bayeh] provides a unique identifier for each session, and requires the comparison of only a single parameter. This speeds up the operation of the accelerator and reduces overall latency of the connection.

What is more, with respect to the motivation to combine aspects of Bernstein with Brendel and Bayeh, the Examiner also states on p. 6 of the Current Office Action:

[Bernstein's accelerator switch] would have been an advantageous addition to the system disclosed by Brendel and Bayeh since it would allow packets to bypass the load balancer and be sent directly to their destination by the accelerator switch, reducing the load on the load balancer and speeding up data transfer.

Clearly, in contravention to the requirements for a valid §103(a) rejection stated above, the above-quoted arguments lack any basis in objective evidence of record that would motivate one skilled in the art to combine the references as suggested. Instead, the Examiner has apparently used improper hindsight by using the Appellant's teachings as a blueprint to hunt through the prior art for

the claimed elements and combine them as claimed. The result is at least two arguments to combine references that find their motivation in advantageous aspects of the present invention, namely speeding up the connection and reducing the load on the load balancer. The Federal Circuit has repeatedly held that such an approach is “an illogical and inappropriate process by which to determine patentability.” Sensonic, Inc. v. Aerosonic Corp., 81 F.3d 1566, 1570, 38 USPQ2d 1551, 1554 (Fed. Cir. 1996).

Furthermore, as stated above in general terms, Appellant submits that the addition of aspects of Bernstein to the primary reference, Brendel, would change the principle of operation of Brendel. In formulating the §103(a) of claim 1, the Examiner correctly states that “Brendel fails to specifically disclose that the accelerator and the load balancer are discrete elements” (Current Office Action, p. 6). For this reason, the Examiner relies on Bernstein to teach an accelerator switch element discrete from a load balancer element. Nevertheless, one skilled in the art will recognize that this addition of an entirely new element (i.e., Bernstein’s discrete accelerator switch) to Brendel would require a substantial reconstruction and redesign of both the arrangement of the elements and the handling of signals in Brendel’s invention. As a result, there would be no technological motivation for engaging in the modification. To the contrary, there would be a disincentive.

For at least the foregoing reasons, Appellant asserts that the §103(a) rejection of independent claim 1 is defective. Moreover, dependent claims 2-5, 7, 11 and 12 are believed to be in condition for allowance for at least the same reasons as their independent base claim, independent claim 1.

#### Claims 13-16 and 19

Like independent claim 1, independent claim 13 sets forth a method comprising steps performed by both a load balancer element and a discrete accelerator element. As a result, the Examiner, in formulating the §103(a) rejection of this claim, relies on the same argumentation for combining Brendel and Bernstein as that described above (Current Office Action, p. 10). Accordingly, Appellant submits that the §103(a) rejection of this claim is defective for at least the same reasons set forth above with respect to independent claim 1.

Dependent claims 14-16 and 19 are believed to be in condition for allowance for at least the same reasons as their independent base claim, independent claim 13.

Claim 17

Dependent claim 17 is believed to be in condition for allowance for at least the same reasons as its independent base claim, independent claim 13.

Moreover, Appellant notes that in order “[t]o establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.” MPEP §2143.03, citing In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Appellant suggest that this requirement has not been met with respect to all the limitations of claim 17.

Claim 17 sets forth:

A method according to claim 13, wherein receiving the packet comprises receiving a packet directed from the load balancer to a server.

In formulating the §103(a) rejection of this claim, the Examiner argues the limitations of this claim are taught or suggested by Brendel at col. 12, lines 55-58. Nevertheless, the cited portion of Brendel merely states:

The load balancer then sends the packet(s) containing the URL request to the assigned server as packet PUSH(0)'. The server reads its local disk and sends the requested file to the browser as data transfer 104.

Appellant respectfully suggests that this portion of Brendel clearly fails to teach or suggest anything resembling receiving by an accelerator “a packet directed from the load balancer to a server.” The §103(a) rejection of claim 17 is therefore defective.

Claim 23

Dependent claim 23 is believed to be in condition for allowance for at least the same reasons

as its independent base claim, independent claim 13. Moreover, Appellant believes that the §103(a) rejection of this particular claim is also defective.

Dependent claim 23 sets forth:

A method according to claim 13, further comprising receiving, by the accelerator, a packet directed from or to an additional load balancer and creating, by the accelerator, an entry in the list of destination servers, responsive to the packet directed from or to the additional load balancer.

In formulating the §103(a) rejection of this claim, the Examiner states on p. 12 of the Current Office Action:

With regard to claim 23, while the system disclosed by Brendel in view of Bayeh shows substantial features of the claimed invention (discussed above), it fails to disclose an additional load balancer using the same accelerator.

Brendel discloses the presence of multiple load balancers for redundancy in case the primary load balancer fails (Col. 18, Lines 44-54). However, it would have been advantageous to have load balancers share the accelerator in order to reduce the number of accelerators required.

Therefore, it would have been obvious to anyone of ordinary skill in the art at the time the invention was made to allow multiple load balancers to share a single accelerator, creating a single entry point into the network, and ensuring different sessions are not accidentally assigned the same session ID by different accelerators. This would prevent packets from being incorrectly routed to the wrong server.

Appellant respectfully submits that this §103(a) rejection is entirely devoid of any objective evidence of record that would motivate one skilled in the art to modify the proposed references as suggested by the Examiner. Instead, the argument is apparently based on what the Examiner believes would be “advantageous.” The above argument is therefore based on precisely the type of “subjective belief and unknown authority” that the Federal Circuit has found insufficient to create a valid §103(a) rejection.

### 3. Rejection under §103(a) over Brendel in view of Bernstein

#### Claims 28 and 33-36

Independent claim 28 sets forth a load balancing accelerator that operates in conjunction with a separate load balancer element. As a result, the Examiner, in formulating the §103(a) rejection of this claim, relies on the same argumentation for combining Brendel and Bernstein as that described above in section 2 (Current Office Action, p. 13). Accordingly, Appellant submits that the §103(a) rejection of this claim is defective for at least the same reasons set forth above with respect to independent claim 1.

Dependent claims 33-36 are believed to be in condition for allowance for at least the same reasons as their independent base claim, independent claim 28.

#### Claims 29-31

Dependent claims 29-31 are believed to be in condition for allowance for at least the same reasons as their independent base claim, independent claim 28. Moreover, Appellant believes that the §103(a) rejection of these particular claims is also defective.

Dependent claim 29, for example, sets forth:

An accelerator according to claim 28, wherein the controller comprises a user interface through which a user may configure the field sets in which the data entries of the table are stored.

In formulating the §103(a) rejection of claims 29-31, the Examiner states on p. 14 of the Current Office Action:

With regard to claims 29, 30, and 31, while the system disclosed by Brendel shows substantial features of the claimed invention (discussed above), it fails to disclose how the controller determines the field sets in which the data entries are stored.

However, it is clear that the method of determining the field sets in which to place the data entries does not affect the functionality of the invention. Any method that chooses the correct field sets to use for a particular application would be acceptable. In some applications, it would be advantageous to have a user interface through which a user may

configure the desired field sets in order to give the system administrator more control over the acceleration process. In other applications, it would be advantageous to have the controller automatically determine the appropriate field sets by analyzing responses from the load balancer. For example, responses from the load balancer can be analyzed and it can be determined what mode the load balancer is operating in such as half NAT, full NAT, or triangulation.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use any one of a plurality of methods for determining the field sets in which to store data entries. Different application (*sic*) can benefit from different methods of determining the appropriate field sets. A user interface provides more control over the acceleration process while automating the determination speeds up the process and reduces the need for user intervention.

Appellant respectfully submits that this §103(a) rejection is entirely devoid of any objective evidence of record that would motivate one skilled in the art to modify the proposed references as suggested by the Examiner. Instead, the argument is apparently based on what the Examiner believes would be “advantageous.” The above argument is therefore based on precisely the type of “subjective belief and unknown authority” that the Federal Circuit has found insufficient to create a valid §103(a) rejection.

#### Claim 32

Dependent claim 32 is believed to be in condition for allowance for at least the same reasons as its independent base claim, independent claim 28.

Moreover, Appellant suggest that the proposed reference combination fails to teach or suggest all the limitations of the claim.

Claim 32 sets forth:

An accelerator according to claim 28, wherein the controller determines the field sets in which the data entries of the table are stored, such that at a single time all the data entries of the table are stored in the same field sets.

In formulating the §103(a) rejection of this claim, the Examiner argues the limitations of this claim

are taught or suggested by Brendel's session table entry described at col. 12, lines 13-17. Nevertheless, the cited portion of Brendel merely states:

The SYN(0) packet is routed to the load balancer since it is an incoming packet, and the load balancer sets up a session with the browser by setting aside memory space and creating an entry in a session table.

Appellant respectfully suggests that this portion of Brendel clearly fails to teach or suggest anything resembling storing data entries in a table "such that at a single time all the data entries of the table are stored in the same field sets." The §103(a) rejection of claim 32 is therefore defective.

#### Claims 37 and 38

Independent claim 37 sets forth a load balancing accelerator that operates in conjunction with a separate load balancer element. As a result, the Examiner, in formulating the §103(a) rejection of this claim, relies on the same argumentation for combining Brendel and Bernstein as that described above in section 2 (Current Office Action, p. 18). Accordingly, Appellant submits that the §103(a) rejection of this claim is defective for at least the same reasons set forth above with respect to independent claim 1.

Dependent claim 38 is believed to be in condition for allowance for at least the same reasons as its independent base claim, independent claim 37.

#### Claims 39-41

Dependent claims 39-41 are believed to be in condition for allowance for at least the same reasons as their independent base claim, independent claim 37. Moreover, Appellant believes that the §103(a) rejection of these particular claims is also defective.

Dependent claim 39, for example, sets forth:

An accelerator according to claim 37, wherein the controller determines the operation mode of the forwarding unit based on a user configuration.

In formulating the §103(a) rejection of claims 39-41, the Examiner states on p. 19 of the Current Office Action:

With regard to claims 39, 40 and 41, while the system disclosed by Brendel shows substantial features of the claimed invention (discussed above), it fails to disclose how the controller determines in which mode the forwarding unit operates.

However, it is clear that the method of determining the mode in which the forwarding unit operates does not affect the functionality of the invention. It would be advantageous to have the forwarding unit operating in the same mode as the load balancer. This would allow the network to continue functioning exactly as it did before the accelerator was installed. In some applications, it would be advantageous to have a user interface through which a user may configure the desired mode in order to give the system administrator more control over the acceleration process. In other applications, it would be advantageous to have the controller automatically determine the appropriate mode. This could be accomplished by examining the contents of the packets directed to/from the load balancer to packets coming from the load balancer. For example, responses from the load balancer can be analyzed and it can be determined what mode the load balancer is operating in such as half NAT, full NAT, or triangulation. The mode of operation of the forwarding unit could then be set accordingly.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use any one of a plurality of methods for determining the mode of operation of the forwarding unit. Different applications can benefit from different methods of determining the appropriate mode of operation. A user interface provides more control over the acceleration process while automating the determination speeds up the process, eliminates human error, and reduces the need for user intervention.

Appellant respectfully submits that this §103(a) rejection is entirely devoid of any objective evidence of record that would motivate one skilled in the art to modify the proposed references as suggested by the Examiner. Instead, the argument is apparently based on what the Examiner believes would be “advantageous.” The above argument is therefore based on precisely the type of “subjective belief and unknown authority” that the Federal Circuit has found insufficient to create a valid §103(a) rejection.



4. Rejection under §103(a) over Brendel in view of Bayeh in further view of allegedly admitted prior art in further view of Bernstein in further view of Cisco

Claim 18

Dependent claim 18 is dependent on independent claim 13. Moreover, Cisco fails to remedy the fundamental deficiencies of the §103(a) rejection of independent base claim 13 over Brendel in view of Bayeh in further view of allegedly admitted prior in further view of Bernstein, described above in section 2. Dependent claim 18 is therefore believed to be in condition for allowance for at least the same reasons as its independent base claim 13.

Claims 20-22

Dependent claim 20 is dependent on independent claim 13. Moreover, Cisco fails to remedy the fundamental deficiencies of the §103(a) rejection of independent base claim 13 over Brendel in view of Bayeh in further view of allegedly admitted prior in further view of Bernstein, described above in section 2. Dependent claim 20 is therefore believed to be in condition for allowance for at least the same reasons as its independent base claim 13.

Moreover, Appellant believes that the §103(a) rejection of this particular claim is also defective.

Dependent claim 20 sets forth:

A method according to claim 13, wherein creating the entry comprises creating the entry using information not included in the received packet as it was received.

In formulating the §103(a) rejection of this claim, the Examiner states on pp. 21-22 of the Current Office Action:

With regard to claim 20, while the system disclosed by Brendel, Bayeh, and Bernstein shows substantial features of the claimed invention (discussed above), it fails to disclose that creating the entry comprises creating the entry using information not included in the received packet as it was received.

Cisco Systems teaches a method of creating an entry in the session table that uses information from the received packet and information from a copy of the received packet which is forwarded to the load balancer. Cisco Systems disclose (*sic*) that packets which are potential sessions are cached when they are received from the client. The packet is forwarded to the load balancer. If the load balancer changes the destination address in the returned packet, the accelerator validates the flow and completes the entry. All future packets belonging to the same session bypass the load balancer (Page 9, Line 14 to Page 10, Line 2). This method allows for the identification of the beginning and end of individual sessions as well as enables the accelerator to detect the mode of operation of the load balancer based upon the differences between the two packets.

Therefore, it would have been obvious to anyone of ordinary skill in the art at the time the invention was made to use the method of creating an (*sic*) session entry disclosed by Cisco Systems to create entries in the session table disclosed by Brendel. This method allows for the identification of the beginning and end of individual sessions as well as enables the accelerator to detect the mode of operation of the load balancer based upon the differences between the two packets. The identification information for subsequent packets of the session may then be appropriately chosen based upon the load balancer's mode of operation.

Appellant respectfully submits that this §103(a) rejection is entirely devoid of any objective evidence of record that would motivate one skilled in the art to combine the proposed references as suggested by the Examiner. Instead, the argument is apparently based on what the Examiner believes would be a beneficial improvement. The above argument is therefore based on precisely the type of "subjective belief and unknown authority" that the Federal Circuit has found insufficient to create a valid §103(a) rejection.

Dependent claims 21 and 22 are dependent on claim 20 and are therefore believed to be in condition for allowance for at least the same reasons as claim 20.

#### Claim 24

Dependent claim 24 is dependent on independent claim 13. Moreover, Cisco fails to remedy the fundamental deficiencies of the §103(a) rejection of independent base claim 13 over Brendel in view of Bayeh in further view of allegedly admitted prior in further view of Bernstein, described above in section 2. Dependent claims 24 is therefore believed to be in condition for allowance for at least the same reasons as its independent base claim 13.

Moreover, Appellant believes that the §103(a) rejection of this particular claim is also defective.

Dependent claim 24 sets forth:

A method according to claim 13, further comprising:  
receiving, by the accelerator, packets directed to a Web site handled by the load balancer;  
storing identification information and values of one or more parameters of the packets directed to the Web site, in a temporary storage; and  
searching the temporary storage for an entry which matches a packet directed from the load balancer,  
wherein creating the entry in the list of destination servers of packet groups is performed only if a match is found.

In formulating the §103(a) rejection of this claim, the Examiner states on pp. 22-23 of the Current Office Action:

With regard to claim 24, while the systems disclosed by Brendel, Bayeh, and Bernstein shows substantial features of the claimed invention (discussed above), it fails to disclose the storing of identification information and values of one or more parameters of the packets directed to the Web site, in a temporary storage; and searching the temporary storage for an entry which matches the received packet from the load balancer, wherein creating the entry in the list of destination servers of packets groups is performed only if a match is found.

Cisco Systems teach (*sic*) the process of storing identification information and values of one or more parameters of the packets directed to the Web site in a temporary storage (cache flow information of potential session); and searching the temporary storage for an entry which matches a packet directed from the load balancer (look to see if received packet matches cached information); wherein creating the entry in the list of destination servers of packets (*sic*) groups is performed only if a match is found (modified packet received from load balancer triggers creation of valid entry) (Page 9, Line 14 to Page 10, Line 2). This process ensures that only valid sessions are entered into the table, reducing the amount of session entries. This also prevents invalid sessions from taking entries in the table away from valid sessions, increasing the efficiency of the accelerator.

Therefore, it would have been obvious to anyone of ordinary skill in the art at the time the invention was made to modify the system disclosed by Brendel, Bayeh, and Bernstein to use a temporary storage to hold information about potential sessions. Once the sessions have been confirmed by a response from (*sic*) the load balancer, a permanent entry can be made in

the table. This ensures that only valid sessions are placed in the session table, increasing the efficiency of the acceleration process.

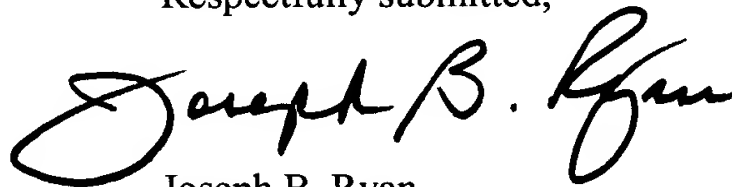
Appellant respectfully submits that this §103(a) rejection is entirely devoid of any objective evidence of record that would motivate one skilled in the art to combine the proposed references as suggested by the Examiner. Instead, the argument is apparently based on what the Examiner believes would be a beneficial improvement. The above argument is therefore based on precisely the type of “subjective belief and unknown authority” that the Federal Circuit has found insufficient to create a valid §103(a) rejection.

5. Rejection under §103(a) over Brendel in view of Srisuresh in further view of Bernstein  
Claim 6

Dependent claim 6 is dependent on independent claim 1. Moreover, Srisuresh fails to remedy the fundamental deficiencies of the §103(a) rejection of independent base claim 1 over Brendel in view of Bernstein, described above in section 2. Dependent claim 6 is therefore believed to be in condition for allowance for at least the same reasons as its independent base claim 13.

For at least the reasons given above, Appellant respectfully requests withdrawal of the §112 and §103(a) rejections.

Respectfully submitted,



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CLAIMS APPENDIX

1. A method of accelerating the operation of a load balancer by an accelerator switch, comprising:

receiving, by the accelerator switch, packets directed to the load balancer, the load balancer being configured to operate in a first mode and a second mode, wherein the load balancer operating in the first mode changes at least one of a destination IP address and a destination port of one or more packets it forwards and the load balancer operating in the second mode changes at least a source IP address and a destination IP address of one or more packets it forwards;

determining, for at least one of the received packets, whether the packets match an entry of a list of packet groups, by comparing fewer than five packet parameters that are not changed by the load balancer to respective fields of entries of the list; and

forwarding, by the accelerator switch, at least one of the received packets, directly to its destination, responsive to the determining.

2. A method according to claim 1, wherein determining whether the packets match an entry of the list comprises comparing three or fewer parameters of the packets to respective fields in the list.

3. A method according to claim 2, wherein determining whether the packets match an entry of the list comprises comparing two parameters of the packets to a respective field in the list.

4. A method according to claim 2, wherein determining whether the packets match an entry of the list comprises comparing a single parameter of the packets to a respective field in the list.

5. A method according to claim 1, wherein receiving packets directed to the load balancer comprises receiving packets directed from a client to a Web site associated with the load balancer and forwarding at least one of the received packets directly to its destination comprises forwarding the

packets from the clients to one of the servers of the Web site without passing through the load balancer.

6. A method according to claim 5, wherein determining whether the packets match an entry of the list comprises comparing the source IP address and source port of the packets to respective fields in the list.

7. A method according to claim 5, wherein the compared parameters do not include a destination address.

8. A method according to claim 1, wherein receiving packets directed to the load balancer comprises receiving packets directed from a server to a client and forwarding at least one of the received packets directly to its destination comprises forwarding the packets from the server to the client without passing through the load balancer.

9. A method according to claim 8, wherein determining whether the packets match an entry of the list comprises comparing the destination port of the packets to respective fields in the list.

10. A method according to claim 8, wherein the compared parameters do not include a source address.

11. A method according to claim 1, wherein forwarding at least one of the received packets comprises forwarding packets for which a matching entry was found.

12. A method according to claim 1, wherein the load balancer operates in half NAT or full NAT mode.

13. A method of creating an entry in a list which correlates between packet groups and respective destination servers, comprising:

receiving, by an accelerator, a packet directed from or to a load balancer, the load balancer being configured to operate in a first mode and a second mode, wherein the load balancer operating in the first mode changes at least one of a destination IP address and a destination port of one or more packets it forwards and the load balancer operating in the second mode changes at least a source IP address and a destination IP address of one or more packets it forwards; and

creating, by the accelerator, an entry comprising parameters not changed by the load balancer in the list of destination servers, responsive to the received packet.

14. A method according to claim 13, wherein creating the entry comprises creating an entry which does not include a destination address of a Web site.

15. A method according to claim 13, wherein the packet is directed from or to a load balancer operating in a half NAT mode.

16. A method according to claim 13, wherein the packet is directed from or to a load balancer operating in a full NAT mode.

17. A method according to claim 13, wherein receiving the packet comprises receiving a packet directed from the load balancer to a server.

18. A method according to claim 13, wherein receiving the packet comprises receiving a packet directed from a server to the load balancer.

19. A method according to claim 13, wherein creating the entry comprises creating the entry using only information in the received packet as it was received.

20. A method according to claim 13, wherein creating the entry comprises creating the entry using information not included in the received packet as it was received.

21. A method according to claim 20, wherein creating the entry comprises creating the entry using information from a copy of the received packet, previously received by the accelerator.

22. A method according to claim 21, wherein receiving the packet comprises receiving a packet from the load balancer and creating the entry comprises creating the entry using information from the received packet and from a copy of the received packet forwarded to the load balancer.

23. A method according to claim 13, further comprising receiving, by the accelerator, a packet directed from or to an additional load balancer and creating, by the accelerator, an entry in the list of destination servers, responsive to the packet directed from or to the additional load balancer.

24. A method according to claim 13, further comprising:  
receiving, by the accelerator, packets directed to a Web site handled by the load balancer;  
storing identification information and values of one or more parameters of the packets directed to the Web site, in a temporary storage; and  
searching the temporary storage for an entry which matches a packet directed from the load balancer,  
wherein creating the entry in the list of destination servers of packet groups is performed only if a match is found.

25. A method according to claim 24, wherein storing the identification information comprises storing a unique identification number tagged to the packet by the accelerator.

26. A method according to claim 24, wherein storing the identification information comprises storing at least one of the sequence and acknowledge fields of TCP packets.



27. A method according to claim 26, wherein storing the identification information comprises storing a leading segment of the payload of the packet.

28. A load balancing accelerator, comprising:  
an input interface which receives packets directed to a load balancer;  
a table which lists packet groups and their respective destination servers, the table having physical entries which can accommodate different field sets for storage of data entries;  
a comparator which compares at least one of the packets directed to the load balancer to one or more of the data entries of the table;  
a forwarding unit which forwards at least one of the packets for which a match was found by the comparator, directly to a server, responsive to the contents of the matching data entry; and  
a controller which determines in which field set, from the plurality of different field sets, each of the data entries of the table is stored.

29. An accelerator according to claim 28, wherein the controller comprises a user interface through which a user may configure the field sets in which the data entries of the table are stored.

30. An accelerator according to claim 28, wherein the controller automatically determines the field sets in which the data entries are stored.

31. An accelerator according to claim 30, wherein the controller transmits one or more packets to the load balancer and examines the response of the load balancer to determine the field sets in which the data entries are stored.

32. An accelerator according to claim 28, wherein the controller determines the field sets in which the data entries of the table are stored, such that at a single time all the data entries of the table are stored in the same field sets.

33. An accelerator according to claim 28, wherein the controller determines the field sets in which the data entries of the table are stored, such that at least during some periods of operation of the accelerator, the table includes at least two data entries stored in different field sets.

34. An accelerator according to claim 28, wherein at least one of the physical entries of the table can be configured for use with different field sets.

35. An accelerator according to claim 28, wherein the table comprises a plurality of sub-tables with physical entries having different field sets.

36. An accelerator according to claim 28, wherein the input interface receives packets directed to a plurality of load balancers and wherein the data entries corresponding to a first load balancer are stored in a first set of fields and data entries corresponding to a second load balancer are stored in a second set of fields different from the first set of fields.

37. A load balancing accelerator, comprising:  
an input interface which receives packets directed to a load balancer;  
a table which lists packet groups and their respective destination servers;  
a comparator which compares at least one of the packets directed to the load balancer to at least one of the entries of the table;  
a forwarding unit which forwards directly to a server, at least one of the packets for which a match was found by the comparator, responsive to the contents of the matching entry, the forwarding unit being capable of operating in a plurality of operation modes, at least one of the operation modes including changing at least one of the fields of the forwarded packets; and  
a controller which determines in which mode the forwarding unit operates.

38. An accelerator according to claim 37, wherein the forwarding unit is capable of performing splicing.

39. An accelerator according to claim 37, wherein the controller determines the operation mode of the forwarding unit based on a user configuration.

40. An accelerator according to claim 37, wherein the controller determines the operation mode of the forwarding unit based on the contents of packets directed from or to the load balancer.

41. An accelerator according to claim 37, wherein the controller determines the operation mode of the forwarding unit by comparing the contents of packets from the load balancer with packets directed to the load balancer.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None